



LETTERS, &c.

ON THE SUBJECT

OF

*QUARANTINE.*

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*To Sir JOHN COX HIPPISEY, Bart.*

*London, 26th December, 1798.*

SIR,

IN compliance with your wish I send enclosed a copy of my letter to the American Minister on the Nature of Infection, and the Means of counteracting it, and beg you will do me the honor of presenting it to the Turkey Company.

In our conversation on this subject some time ago, I mentioned to you some information I had from the Turkish Ambassador, which probably led you to think that what I lately wrote was addressed to him; but though it relates chiefly to the Yellow Fever, the observations apply to infection in general; and as my illustrations and arguments are mostly drawn from the plague, the practical remarks are nearly the same as if this epidemic had been expressly treated of.

I have, however, turned my thoughts still farther to this subject; and I cannot but feel the confidence you are pleased to repose in me, as imposing a most serious responsibility in what

so deeply concerns the national safety, and commercial interests of this country. This consideration will, I hope, prevent me from advancing any thing lightly in what I have farther to say on a subject so momentous.

I apprehend it ought to be a leading maxim in regulating the measures to be taken for the exclusion and destruction of infection, that the means should in all points be as nearly as possible commensurate to the end. It is as dangerous to go beyond the object as to fall short of it. Unnecessary rigor not only creates personal hardship, commercial loss, and distress, but defeats its own purpose, by loosening the sanctions and motives which ought to insure the strict observance of rules. The temptations arising from self-interest to contravene whatever militates against itself, are in all cases very strong, but must be doubly so when there is a conviction of the unnecessary severity of the restraining laws.

The rigor of quarantine should therefore be different according to the degree of risque. The varieties of these risques depending on the greater or less chance of importing infection, has been sufficiently attended to by others. What I mean now to insist upon, is the greater or less chance of its taking effect when actually imported.

I have noticed, in the enclosed letter, the different degrees of susceptibility to epidemic diseases, arising from the improvement of manners, and the progress of civilization. Those only, whose duty leads them to consider the subject, are aware how much the welfare of the human species depends on ventilation and cleanliness; and no one could render a greater service to his fellow creatures, than to impress on their minds the necessity of cultivating them as moral and religious duties; or, at least, to inform the more enlightened part of mankind of the truth and great importance of these facts. There is sufficient proof of them both in ancient and modern history.

Though Egypt, in modern times, is considered as the constant abode, and fountain as it were of pestilence, yet Herodotus (Enterp. 37) observes, that its inhabitants, and those of Lybia, are the most healthy in the world; and remarks, that they were eminently cleanly. It is observable that, that part of Hindostan which lies in the temperate zone, and therefore under that range of atmospheric heat which is favorable to the plague, has never yet been afflicted with it, in so far as we can learn from history, though a commercial intercourse is kept up with the Turkish dominions. This can only be ascribed to the great cleanliness prescribed by their religion.

The modes of life, in this country, have undergone a com-

pleat revolution in this respect within the last two hundred years; and it is to this I have chiefly ascribed our long exemption from the plague. Holland affords a still stronger proof of this. The Dutch, in the period alluded to, have been not only the most commercial and the most cleanly people of Europe, but, perhaps, the most slovenly and careless with regard to the exclusion of pestilential infection; and yet they have not in that time been visited by the plague.

And it is farther worthy of remark, that they not only expose themselves to it, but their neighbours; for their cargoes brought from the Levant, consisting of certain raw materials, very liable to harbour infection, are conveyed immediately to England, after undergoing, as I am credibly informed, certain precautionary processes, which are little better than empty forms.

There is another circumstance relating to susceptibility, which, though it has not as yet, so far as I know, been considered as effecting the regulations of trade and quarantine, will, I apprehend, be found well worth attending to. It is invariably remarked, in all countries liable to the plague, that there are certain seasons of the year in which the people are incapable of being affected by it. It has never spread in this country, but in the months of July, August, September, and October, and has then spontaneously ceased. Now, is it conceivable that the

trifling quantity of infection which may adhere to a bale of goods, imported in the month of November, for example, can have any effect in exciting the plague, when the infection, accumulated from thousands of sick persons, becomes at that time innocuous? Might not commerce, therefore, avail itself of this distinction of seasons, by making the importation from infected or suspected ports in the winter six months, thereby avoiding the risques of propagating disease, and diminishing the necessity of rigorous precautionary measures? During this season the principal object would be to dissipate any possible infection by airings, or to destroy it by fumigation, in order that it may not lurk till the return of the susceptible season.

The only other question of importance which I shall now touch upon is, whether Lazarettoes ought to be afloat or on shore.

The advantages of their being afloat, are, First, That they are more airy than those on shore of the most approved construction, which are surrounded by high double walls. The flux and reflux of the tide also produces some degree of salutary agitation of the air; and both their ports and upper works are constructed with lattice-work for the perflation of air. Secondly, That they are more easily guarded. Thirdly, That they are less

expensive. Fourthly, That they are moveable; and, Fifthly, That they admit better of being multiplied.

The only objection I have heard to them is, that they are not sufficiently large; but those who make this objection, can hardly be aware of the extensive accomodations practicable in a large ship of war.

The expence attending the erection of the numerous Lazarettoes that would be necessary, is, I apprehend, a solid objection against them; and it might hereafter be found, that they were not placed on the most commodious spots, whereas hulks are moveable. The Levant is not the only part of the world from whence the infection to be guarded against is imported; for, about twenty-five years ago, a system of restrictive regulations was adopted, with regard to ships from the ports of the Baltic, while the plague was in Russia and Poland.

It occurs to me that St. Mary's, Scilly, or Falmouth, would be the best places for the quarantine of the trade from the Levant; and Hull, Yarmouth, and the Isle of Grain, at the mouth of the Medway, for the trade from the Baltic. This last situation would probably be found more commodious than Standgate Creek, from its being an island, and more convenient for the port of London, from its adjoining to the Thames.

The whole of the country on that part of the Medway is very damp, but this is rather a recommendation than an objection ; for though damp air is unwholesome, this is partly owing to its greater attraction for noxious *effluvia*, whereby it carries it off sooner than dry air would. It is remarked in Turkey, that one night's ventilation of goods in a foggy or damp air, is more effectual than a month of dry weather.

The only advantage that occurs to me of Lazarettoes on shore, over those afloat, is that, they afford a more agreeable retreat to passengers and others during their confinement. This is well worth attention, not only from considerations of humanity, but because every addition to personal hardship is an additional temptation to infringe the established rules. This advantage might easily be combined with the floating Lazarettoes, by erecting some apartments on a small scale on the adjacent beach, for the clothing and purification of such persons, and for their residence during the prescribed time.

But if these floating Lazarettoes should not be considered as ultimately preferable, they certainly are unexceptionable as temporary succedaneums ; more especially at this moment, when from the particular relations of the foreign powers, a great increase of the Turkey Trade is rendered probable ; and when every obstacle to it should be removed, in so far as is consistent

with the public safety. And, in case they *should* be found adequate to the purpose, I apprehend no intermediate quarantine would be necessary in the Mediterranean, such as is prescribed to be performed at Malta, or Leghorn; for this was intended by the legislature merely as a temporary regulation till Lazarettoes should be built.

These are the remarks which have occurred to me since I saw you; and if you think them deserving of being communicated to the Turkey Company, you are welcome to do so. For further information I beg to refer you to the work of Doctor RUSSELL, who has deserved highly of the world for the intrepidity, ingenuity, and industry, he has displayed in his labors in this branch of his profession.

I am, with much respect,

SIR,

Your most obedient,

Humble Servant,

GIL: BLANE.

*To RUFUS KING, Esq.*

*London, 26th November, 1798.*

SIR,

I SIT down to perform the promise I made you this morning, of putting on paper some remarks on the Nature of the Yellow Fever, and the Means of preventing it.

In doing this I shall chiefly confine myself to those views of it in which the Magistrate is concerned. The adopting of measures for the prevention of disease is one of the most important duties of a wise and patriotic government; and the discovery of these means, as well as the efficiency of the steps to be taken, must depend on a thorough knowledge of the causes by which it is excited and influenced. My opportunities upon actual service in the West Indies, in the late war, when Physician to the fleet under the command of Lord Rodney, and Admiral Pigot, and my present official duty as a member of the medical-board of the navy, have necessarily brought to my knowledge a number of facts relating to this subject; and I shall be extremely happy if the communication of some of the most important of

them can throw any light which may prove useful to the American Government, in checking an evil so afflicting and calamitous.

The first question that occurs with a view to preventive measures is, whether this disease be infectious, and under what circumstances it is so?

In those situations in which I observed it in the West Indies, it was evidently so. There was the most incontestable evidence of this both on board of ships and at hospitals; and the doubts which have been started on this point seem to have arisen from the effects of infection being blended with those which arose from other causes.

But whatever doubts there may be on this subject in the West Indies, there can be none in the climate of North America. This will be best proved and illustrated by an example.

On the 16th of May, 1795, the *Thetis* and *Hussar* frigates captured two French armed ships, from Guadaloupe, on the coast of America; one of these had the yellow fever on board, and out of fourteen men sent from the *Hussar* to take care of her, nine died of this fever before she reached Halifax on the 28th of the same month, and the five others were sent to the

hospital sick of the same distemper. Part of the prisoners were removed on board of the Hussar, and though care was taken to select those seemingly in perfect health, the disease spread rapidly in that ship, so that near one-third of the whole crew was more or less affected by it.

This fact carries a conviction of the reality of infection as irresistible as volumes of argument; and it further affords matter of important and instructive information, by proving that the infection may be conveyed by the persons or clothes of men in health.

It is a question of still more consequence, with a view to preventive measures, whether this epidemic has arisen in the towns of North America from internal causes, or whether it was imported from the West Indies?

In order to decide upon this it will be necessary to go back into the origin of this disease in so far as it can be ascertained.

After laying together and considering fully all the facts relating to this subject, it appears to me that the yellow fever cannot be produced but in a season, or climate, in which the heat of the atmosphere is pretty uniformly, for a length of time, above the 80th degree of Fahrenheit's thermometer; that under the

influence of this heat, Europeans newly arrived, and more especially in circumstances of intemperance, or fatigue in the sun, may be subject to it in many instances; but that it has usually become general only by the previous influence of that infection which produces the jail, hospital, or ship-fever, or from the influence of putrid exhalations; and that when so produced it continues itself by infection. It would be too tedious to enumerate the multiplied proofs of this, which have occurred to me in my connexion with the public service. With regard to the effect of ship-infection, it is enough to say that the seamen of ships of war from England, having infectious fevers on board, were observed to be most subject to the yellow fever when they arrived in the West Indies; and, that the troops which have been conveyed in ill-aired, crowded, and sickly transports, are most liable to it after disembarking. This applies even to that part of them who have arrived in health. And with regard to the effect of putrid exhalations I need only mention that, at the time of the battle of the 12th April, 1782, there was not a sickly ship in our fleet; but many of those officers and men who were sent to take care of the French prizes, were seized with the yellow fever; and it was observed that when at any time the holds of these ships, which was full of putrid matter, was stirred, there was an evident encrease of these fevers soon after.

It has been alledged by some authors that the yellow fever

is produced by the same marshy exhalations which produce the intermittent and remittent fevers ; and, that it is only a variety of the latter. But the remitting fevers differ from it in some essential symptoms, and the yellow fever has been known to arise both in ships and on shore, where men were entirely out of the reach of the vapors of marshes.

It may naturally be expected that this infection, in common with all others, will not take effect except in particular circumstances. There have been physicians paradoxical enough to maintain that the plague itself is not infectious ; and their principal argument is, that numbers are exposed to it, without being affected by it. But the same may be said of the small pox, and it is the nature of all infection to require a certain concurrence of circumstances, both external and in the constitution of those exposed to it, in order to its taking effect. One circumstance necessary to the operation of the infection of the plague, is a certain range of atmospheric heat. A temperature above 80 degrees, or below 60 degrees, will soon put a stop to this epidemic, so that it was never known between the tropics, nor within the polar circles ; and it is only at certain seasons that it appears in the temperate zone.

The atmospheric heat necessary for the excitement of the yellow fever, begins where that of the plague leaves off ; for

it has never been known to arise and prevail but when the thermometer stood, for some length of time, pretty uniformly above 80 degrees, as has been already stated. But not only a certain degree of heat is necessary to bring the infection of the plague into action, but a concurrence of other circumstances depending on cleanliness, ventilation, and a certain obscure state of the atmosphere.

London in the last century was never entirely free from the plague till 1666, and it had in that period been four times epidemic. The last time it was so was in 1665. In 1666 the great fire happened, which gave occasion to rebuilding the city on a more spacious and airy plan; and the greater degree of personal cleanliness which began to prevail about that time, together with the construction of common-sewers, have no doubt been the causes that have counteracted the introduction of it for the last hundred and thirty-two years.

It is farther in proof of a certain given concurrence of circumstances, that particular classes of society are in a great measure exempt from it. Lord Clarendon, in the History of his own Life, relates, that when he, and other people of condition who had fled from the plague, returned to London, they hardly missed one of their friends or acquaintances; the mortality having been confined almost entirely to the lowest orders of the people,

Though it is true, therefore, that in those years in which the plague has prevailed in London, it has become nearly extinct in the month of November, just after the infection had been accumulated to the utmost; and though it is equally true that the small pox, or measles, will frequently occur and become epidemic, though no infection can be traced; yet neither the one nor the other of these facts can be urged as proofs that these diseases are not infectious.

In applying these observations to the question concerning the importation of the infection into Philadelphia, and the other towns of America, I cannot but think, that they make greatly for the affirmative; for it is agreeable to the analogy of all other infection, that it may be introduced so as to prove active in portions so minute as to escape detection, and at other times may fail of producing its effect, though in the most accumulated state.

The circumstances in which it appears in North America, are indeed totally different from those in which it appears in the West Indies. This fever had not prevailed in Philadelphia from 1762, till 1793, whereas it occurs more or less every year in the West Indies, and its prevalence is in proportion to the number of new comers from Europe. If this disease were the spontaneous production of America, how comes it that it did not destroy

the British armies, which acted in the late war in Pennsylvania, Virginia, and Carolina, as it has done of late in the West Indies? It is also against the laws of probability, that this fever should have arisen by mere accident in that year in which a number of Emigrants had arrived from the islands in which it prevailed, and in a year in which it had prevailed there to such an unexampled degree.

Supposing it established therefore as a truth, that this disease arose from imported infection, we are next to enquire what are the precautionary measures that ought to be adopted, to prevent its introduction, or counteract its influence.

These divide themselves into three heads. First, The prevention of the importation. Secondly, The prevention of its spreading. Thirdly, The removal of those circumstances which predispose to its action.

Under the first head is included the regulations relating to quarantines. To enter into the detail of this subject would encroach too much upon your time and mine; and it would be unnecessary, considering the great fulness and accuracy with which this has been done by Dr. Russell, in his Work on the plague.

The second head is extremely important, and the neglect of it has at all times given occasion to the extensive spread of pestilential disorders. The principle of it is comprised in these few words, "To discover the first beginnings of disease, and to cut off all intercourse with the infected." It is at this period only that such a measure can be effectual, the number of infected being small. I must refer to the same work for the detail of the regulations regarding this.

The third head is one which has not been commonly enumerated and treated of by those who have written on this subject. It is only, however, necessary to reflect on the present situation of London, to become sensible of its great importance.

It is extremely doubtful how far this city owes its safety to quarantine; and there is no proof of the pestilence having ever been stopped in England, by the vigilant detection of its first invasion, and the consequent adoption of wise and vigorous measures to prevent intercourse.

But the advantages of spacious and airy habitations, of personal cleanliness, of dryness, and cleanliness from forming drains and common-sewers, are undeniable. The commerce, in this age, to all parts of the world, so far exceeds whatever was known in former ages, that there is most probably at all times

enough of infection in the warehouses of London, to kindle the flames of pestilence, if the fuel were duly prepared and disposed for its action.

I am not sufficiently acquainted with the towns of America, to say what improvements they admit of in the points above-mentioned. It is evident, however, that the causes of this fever are connected with those circumstances which belong to a town; for, if I am rightly informed, it has not spread into villages and single houses in the country. As the inhabitants of America possess habits of cleanliness in their persons and habitations, in common with the rest of the civilized world in our times, the amendment required is not in these points. A circumstance which you mentioned to me regarding New York, to wit, that the fever prevailed only in that quarter of the town which adjoins the east river, and had not spread to that which borders on the north river, seems to point out the measures that are likely to be most adviseable and practicable for meliorating the air of the towns in the American States. Drains and common-sewers, therefore, of the most perfect construction that can be devised, for promoting dryness, and sweetness, by carrying off all superfluous moisture, and for conveying all manner of filth and soil underground, could not fail to be highly conducive to general health, and to prevent the future visitations of epidemic fevers. Whether the late fever has been owing to imported infection, or to the bad

air of the place, this precaution is equally founded upon reason. I consider the drains and sewers of London as the most essential circumstance in promoting that decency, comfort, and health, enjoyed by this great metropolis, in a degree of which I believe there is no example in ancient or modern times.

I am, with much respect,

SIR,

Your most obedient,

Humble Servant,

GIL: BLANE.

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P.S. Upon reconsidering the preceding letter, it has occurred to me that, in enumerating the different heads of preventive means, I ought to have mentioned what is called *expurgation*, that is, the methods taken for the expulsion and destruction of infection when the disease is declining or has ceased. Dr. Russell is very full on this subject; but since he wrote, there is a method of fumigation invented by Dr. Carmichael Smyth, of which he has published an account; and, as this has acquired some name, from trials made in the hospitals for prisoners of war, and in the navy, I should think it would be worth a trial in America, as one of the means of destroying the infection of the yellow fever.

The first of these is the fact that the  
 Government has been unable to secure  
 the necessary funds to carry out its  
 policy of non-interference in the  
 internal affairs of the country.

The second is the fact that the  
 Government has been unable to secure  
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 internal affairs of the country.

QUERIES submitted to Doctor BLANE and Doctor  
JOHNSTON, by the TURKEY COMPANY, with their  
ANSWERS.

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- I. ARE the vessels well adapted for airing cargoes, and can any improvements be made in their construction?

They are well adapted, but many improvements may be made, both for shortening quarantine and for the more effectually purifying merchandize with foul bills.

- II. From the affidavits and testimonials with which we have furnished you with regard to the manner of performing quarantine in Holland, do you conceive that it would be effectual in destroying infection if any adhered to goods imported?

We are of opinion that they would not be effectual.

- III. In case you think these nugatory or insufficient, can you account for the exemption of Holland and England from

the plague for the last 133 years, both these countries having been exposed to the unpurified cotton imported by the Dutch, who have no Lazarettoes of any kind, and make little, if any, distinction between clean and foul bills?

We are inclined to ascribe the happy exemption of these countries from the pestilence since the year 1665, to a want of susceptibility, arising from various improvements in the habits and arts of life. The great fire of London, happened the year after the last plague, and the more spacious and airy manner in which the city was rebuilt, has, no doubt, contributed to its general salubrity, as well as the construction of common-sewers about that time, or soon after; and the general reformation which took place in that age, in the tastes and habits of the people in consequence of the advancement of civilization and commerce, consisting chiefly in personal cleanliness and comfort, from the general use of soap and linen, the more ample supply of fuel in consequence of the importation of coals by sea, and the more free use of vegetable food. It is a general remark in the history of all plagues, both in Asia and Europe, that they break out and prevail only among the lowest and poorest ranks of people, never becoming properly epidemic among the better sort. The general mass of the people are at present in possession of nearly the same comforts and means of cleanliness as the

gentry 200 years ago. The same reasoning we apprehend will apply to Holland.

IV. From your experience and success in destroying infection in the royal navy, do you know of any better method of destroying infection than by airing the articles suspected of containing it?

The method which we trust to in destroying the infection of malignant fevers, not only suspected, but certainly existing, in the clothes of seamen, is by a fumigation with brimstone.

V. The law requiring that Levant goods liable to retain infection, shall be sufficiently opened and aired in the Lazarettoes of Malta, Leghorn, Ancona, Venice, Messina, or Marseilles, (none of which are now accessible); are you of opinion that the same precaution as practised at Leghorn (the authenticated particulars of which are enclosed) which is the usual place where British ships perform their quarantine with foul bills, can be adopted with equal safety to the public in the Lazarettoes at Stangate-Creek; and do you think the floating Lazarettoes have any advantage over those on shore?

There can be no doubt that if the same means are used re-

specting the purification of goods in England that are practised at the places specified in this Quere, it might be done with equal safety to the public; and we are of opinion that floating Lazarettoes with the improvements that may be made in their construction and regulation, with some addition to their establishment, are preferable to any that can be built on shore.

*JA: JOHNSTON.*

*GIL: BLANE.*

QUERY, from the Right Worshipful the LEVANT  
COMPANY, to Doctor JOHNSTON and Doctor BLANE,  
Commissioners for Sick and Wounded Seamen.

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FROM your experience in the navy (which we understand has been very considerable) are you of opinion that the floating Lazarettoes now moored in Standgate Creek, which you have lately inspected, can be guarded with sufficient security to the public Health, and to the Revenue?

ANSWER.

We are of opinion that such methods may be adopted at the floating Lazarettoes now moored in Standgate Creek, as will prove effectual for preventing the Conveyance of infection; and we apprehend the same bars to intercourse will prevent illicit commerce.

*JA: JOHNSTON.*

*GIL: BLANE.*

## Proposed IMPROVEMENTS in the Construction and Regulations of the Lazarettoes in Standgate Creek.

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THE principal Improvements which occur to us, in the construction, would be,

- I. Either to slit and perforate the decks, so as to resemble the gratings, forming the floors of the house, or to take up these decks, and construct gratings in the room of them.
- II. To cut ports in the side between the orlop and lower-gun-deck. Their length should be fore and aft, and close to the lower-gun-deck.
- III. The perflation and change of air would be rendered still more complete, if an opening were made in the roof, surmounted with a moveable skreen, or vane, called a cowl; or with a turret, fitted with louvre boards, as a security against the weather.

With regard to regulations, in so far as these respect the detail of airing goods, we would recommend an imitation of

those practised in the foreign Lazarettoes, which have been found, by long experience, adequate to the purpose. These may be seen described by Mr. Howard, who performed quarantine himself, at Venice, where the first Lazaretto in Europe was established; and where the plague has never been since its first institution. We are, however, of opinion with Mr. Howard, that the time might be abridged, particularly if the methods of destroying infection by fumigation should be adopted.

The regulations most urgently called for at present, on the supposition of ships without clean bills being admitted, are,

- I. To establish a floating infirmary. This should consist of a ship, moored near the Lazarettoes, with one or more medical attendants, proper apartments, bedding, medicines, &c. arranged, on the supposition of the plague actually arising; the possibility of which should never be lost sight of. Even on the present footing of the Lazarettoes it seems necessary, were it only as a matter of humanity towards the superintendents and laborers, who, we are told, at times experienced great hardship from severe illnesses, during which they had been cut off from all medical assistance; and in case of a fracture, or other severe injury, the hardship would be still greater.

II. The next material alteration called for in the regulations, would be, the repeal of that part of the act of parliament of 1754, whereby the superintendents are required, in case of the plague actually appearing, to communicate it to the privy council, and to wait for their directions. As the delay which this would occasion would be attended with the greatest inconvenience, cruelty, and danger, to individuals and the public, we are of opinion, that the superintendent should be authorised to act upon such an emergency, by instantly taking the proper steps for the separation and care of the sick.

III. As guarding is of the utmost importance, we shall suggest some additional precautions and arrangements which will be absolutely necessary, in case of an encreased risque, to the public health, and which may be practised in these floating institutions with superior advantage to those on shore.

We would recommend,

I. That they should be surrounded with chains, attached to posts driven into the mud, or connected by means of buoys.

II. That boats should row guard all night.

- III. That the boats belonging to the Lazarettoes should, when not upon necessary duty, be always either on board, or fastened by chains, with strong padlocks ; the keys of which should be in the custody of the master.
- IV. That centinels with loaded musquets, and with small pieces of ordnance, loaded with grape or cannister shot, should be constantly stationed on the most commanding parts of the Lazarettoes.
- V. That no houses should be erected on the beach, nor near it.

Under these regulations, we apprehend that these Lazarettoes will be less exposed to clandestine intercourse, whether from the anxiety of individuals to visit their friends, or for the purpose of illicit trade, than the Lazarettoes on shore.

*JA: JOHNSTON.*

*GIL: BLANE.*

Office for Sick and Wounded Seamen,  
2d of May, 1799.

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